पाठ्यक्रम

कलन एवं सांख्यिकीय विधियाँ

(Calculus and Statistical Methods)

बी. सी. ए. भाग–I

पूर्णांक : 50

Unit I. Limits, Continuity and differentiability of function (s) of one variable. First and second kind of discontinuities.

Unit II. Differentiation of functions, Differentiation of functions of functions, Parametric functions, Product of functions, Function in product and quotient form, Logarithmic differentiation. Differntiation of parametric functions.

Unit III. Tangent & Normal subtangent, Subnormal, Monotonic increasing and decreasing function, Simple examples of maxima and minima.

Unit IV. **Probability :** Sample space, Types of events (mutually exclusive, equally, likely event, favourable events, dependent and independent events), Composition of events, Additive and multiplicative law of probability, Conditional probability, Inverse probability, Baye's Theorem.

Unit V. Frequency distribution and measures of dispersions, Binomial, Poisson and Normal distribution. Curve fitting and Principle of least square, Correlation and Regressions lines.

SYLLABUS

FUNDAMENTALS OF I.T. & O.S.

B.C.A. PART-I

M.M. : 100

UNIT-I: **Introduction to Computers : Computer system characteristics and capabilities :** Speed, Accuracy, Reliability, Memory capability, Repeatability, **Computer Hardware and software :** Block Diagram of a Computer, Different types of softwares. Data processing : Data, Data processing system, Storing Data, Processing data. **Types of Computers :** Analog, Digital, Hybrid General and Special Purpose Computers. **Computer Generations:** Characteristics of Computer Generations Computer Systems - Micros, Minis & Mainframes. **Introduction to a PC :** The IBM Personal Computer Types of PC systems PC, XT & AT Pentium PC's Limitations of Micro Computer.

UNIT-II: **Computer Organization: Introduction to Input Devices :** Categorizing input Hardware, Keyboard, Direct Entry - Card Readers, Scanning Devices - O.M.R. Character Readers, MICR, Smart Cards, Voice input Devices, Pointing devices - Mouse, Light pen. **Storage devices :** Storage Fundamentals, Primary and Secondary Storage, Data storage and Retrieval Methods - Sequential, Direct & Indexed Sequential, Tape Storage and Retrieval Methods - Tape storage devices, characteristics and limitations, Direct access Storage and Microcomputers - Hard Disks, Disk Cartridges, Direct Access storage Devices for large Computer systems, Mass storage systems and Optical Disks, CD ROM, **Central Processing Unit :** The Microprocessor, control unit, A.L.U., Registers, Buses, Main Memory, Main Memory (RAM) for microcomputers, Read Only Memory (ROM). **Computer Output :** Output Fundamentals, Hardcopy Output Devices, Impact Printers, Non-Impact Printers, Plotters, Computer output Microfilm/Microfiche (COM) systems, Softcopy Output Devices, Cathode Ray Tube, Flat Screen Technologies.

UNIT-III: **Computer Software : System Software :** System software Vs. Application Software, Types of system software Introduction and Types of Operating Systems programs, Booting Loader, Diagnostic Tests, Operating Systems Executive, BIOS, Utility Programs, File Maintenance, Language Processors; Assembler, Compiler & Interpreter. **Application Software :** Microcomputer Software, Interacting with the System, Trends in PC Software, Types of Application Software, Difference between Program and Packages.

UNIT-IV: **Microsoft Disk Operating System :** Introduction, History and Versions of DOS. **Fundamentals of DOS :** Physical structure of the Disk, Compatibility of drives, Disks & DOS versions, Preparing Disks for use, Device Names. **Getting Started with DOS :** Booting Process (DOS, Windows, Unix), System Files and Command.com, Internal, DOS Commands- DIR, MD, CD, COPY, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE. Files & Directories, Elementary External DOS Commands - CHKDSK, MEM, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, HELP, TREE, SYS, LABEL, ATTRIB, Creating a Batch files, Additional Commands - ECHO, PROMPT, EDIT, FORMAT, FDISK, BACKUP, RESTORE, MORE, SORT, APPEND. Introduction to Unix OS, basic commands eg pwd, is, cat, pg, who, ps, mail, cal, File commands-Is, cat, tail, cp, mv, rm, file, type, chmod. Directory Commands - cd, mkdir, rmdir.

UNIT-V: **Overview of GUI & Windows OS :**

Introduction to GUI and various versions of MS-Windows 98, Windows XP, Windows 2000, Windows Vista, Workgroups and domains, Quick launch toolbar, Windows Flip, 3D navigation, Desktop, Internet explorer 7.0, networking features (Sharing files), managing programs and multimedia, control panel, Speech recognitions and Dictation, Handling user accounts, Security and protection features, management tools (updating, diagnosing, configurations, backup and recovery, upgrading windows vista). OLE Concept, Comparative study of Linux, DOS and Windows, features of Windows Vista, reliability, migrating the data.

SYLLABUS

THEORETICAL FOUNDATION OF COMPUTER SCIENCE

B.C.A. PART-I

PAPER-III **M.M. : 50**

INTRODUCTORY ELECTRONICS

UNIT 1. **Semiconductors & Integrated Circuits :** Introduction to semiconductors & its types, Diode, PNP & NPN transistors, CE amplifier & Switching characteristics of Transistors, Logic Families, Scale of Integration, RTL, DTL, TTL and its characteristics.

UNIT 2. **Integrated Circuit Fabrication :** Integrated, circuits technology, Advantages and limitations of Integrated circuits, Basic monolithic integrated circuit technology.

UNIT 3. **Data Representation :** Data types, number systems, fixed point representation, 1's and 2's complements, Binary fixed point representation, arithmetic operation on binary operation, overflow and underflow, codes, ASCII, EBCDIC codes, Grey codes, Excess-3, BCD codes, Error detection and correcting codes.

UNIT 4. **Logic Gates and Boolean Algebra :** Logic getes AND, OR, NOT, gates and their truth tables, NOR, NAND and XOR gates, Boolean algebra, basic Boolean Law, Demorgan's theorem, Map Simplification, Minimizing technique, K-Map, Sum of product, Product of sum.

UNIT 5. **Combinational & Sequential Logic Circuits** Combinational and sequential circuits, binary adder, substractor, Flip flop-RS, D, JK and T flip flop, data & shift register, encoder, decoder, comparator, Multiplexer, Demultiplexer, RAM & ROM.

पाठ्यक्रम

'C'-भाषा प्रोग्रामिंग

(PROGRAMMING IN 'C' LANGUAGE)

बी.सी.ए. भाग–I **पूर्णांक : 100**

UNIT-I : **Fundamentals of C Programming : Overview of C :** History of 'C', Structure of 'C' program. Keywords, Tokens, Data types, Constants, Literals and Variables, Operators and Expressions : Arithmetic operators, Relational operator, Logical operators, Expressions, **Operator :** Operator precedence and associativity, Type casting, Console I/O, formatting, **Unformatted I/O functions :** getch(), getchar, getche(), getc(), put(), putchar(). **Control Constructs :** If-else, conditional operators, switch and break, nested conditional branching statements, **loops :** For, do, while, while, Nested loops, break and continue, goto and label, exit function.

UNIT-II : **Arrays, Strings and Functions : Array :** Array declaration, One and Two dimensional numeric and character arrays. Multidimensional arrays. **String :** String declaration, initialization, string manipulation with/without using library function. **Functions :** Definition, **function components :** Function arguments, return value, function call statement, function prototype. **Type of function arrangement :** return and argument, no return and no argument, return and no argument, no return and argument. Scope and lifetime of variable. Call by value and call by reference. Function using arrays, function with command line argument. **User defined function :** maths and character functions, Recursive function.

UNIT-III : **Structure, Union & Enum-Structure :** Basics, declaring structure and structure variable, typedef statement, array of structure, array within structure, Nested structure, passing structure to function, function returning structure. **Union :** basics, declaring union and union variable, **Enum :** declaring enum and enum variable.

UNIT-IV : **Dynamic Data Structures in 'C'-Pointers :** Definition of pointers, pointer declaration, using & and * operators. Void pointer, pointer to pointer, Pointer in math expression, pointer arithmetic, pointer comparison, dynamic memory allocation functions—malloc, calloc, realloc and free, pointers vs. Arrays, Arrays of pointer, pointer to array, pointers to functions, function returning pointer, passing function as argument to function, pointer to structure, dynamic array of structure through pointer to structure.

UNIT-V : **File Handling and Miscellaneous Features : File handling :** file pointer, file accessing functions, fopen, fclose, fputc, fgetc, fprintf, fscanf, fread, fwrite, beof, fflush, rewind, fseek, ferror. File handling through command line argument. Introduction to C preprocessor, #include, #define, conditional compilation directives : #if, #else, #elif, #endif, #ifndef etc.

PRACTICAL WORK

Max. M. : 100

Scheme of Examination :

Practical examination will be two programs and a project demonstration. It will be of 3 hours duration. All programme with flowchart and algorithms. The distribution of practical marks will be as follows :

Programme 1	-	20
Programme 2	-	20
Programme 3	-	20
Viva	-	25
[Practical Copy + Internal Record]	-	15
Total	-	**100**

पाठ्यक्रम

विजुअल बेसिक प्रोग्रामिंग

(PROGRAMMING IN VISUAL BASIC)

बी. सी. ए. भाग–I

अधिकतम अंक : 50 न्यूनतम अंक : 20

Unit I. **Introduction to Visual Basic :** Hardware requirements, features of VB, Editions of Visual Basic and Event Driven Programming vs procedure oriented programming. Introduction to integrated Development Environment. Basic concepts of Visual Basic programming : Controls, properties, methods, events, forms, projects. Creating Executable files.

Variables, constants, data types, data conversion function, scope of variables operators Control Structure : Conditional/branching statements : If.....else....endif, Select case Looping statements : do....while, for...next, for each, exiting a loop, goto statement, msgbox and input box functions.

Unit II. **Arrays :** Types of arrays, array manipulation, Working with standard controls. Working with control array, various key and mouse events, using drag and drop concepts.

Procedure and Functions : Types of function, library function, date and time function, format function, and string related function, validation function. Creating user defined function and procedure, call by value and call by reference, concept of recursion, working with basic module, class module and form module.

Unit III. **Working with Advanced Controls :** Toolbar, Status bar, Tabbed dialog controls, Progress bar, Animation controls, dtpicker, calendar, common dialog control.

SDI and MDI Application : Creating MDI application, menu editor : defining menu and popup menu, sub main, startup objects. Working with graphics control and using graphic methods.

Unit IV. **Error Handling :** Types of errors, error trapping tools : Watch window, Local window, Immediate window, Debug menu, Tracing program flow with call stack, the err object, error function, error handling routines : on error goto statements.

File Handling : Type of file handling, Sequential file handling : reading, writing and appending in file, understanding user defined data type, Random access file : reading, writing and appending in file.

Unit V. **Data Access Using the ADO Data Control :** Basic concepts of relational database, visual data manager, introduction to SQL, concept of ODBC, Overview of DAO and RDO, Using DAO and RDO to access data. ADO features, difference among ADO, DAO and RDO, accessing and manipulating database using ADO, ADO object hierarchy, concept of recordset and its type, connection object, command object.

Data Environment : Accessing data using data environment, using Datagrid, Data combo, data list, MSHFlexgrid.

Report Generation : Overview of data report, creating data report, adding groups, using data report functions. Introduction to crystal report writer.

PRACTICAL WORK

अधिकतम अंक : 50 न्यूनतम अंक : 20

1. **Scheme of Examination :**

Practical examination will be of 3 hours duration. The distribution of practical marks will be as follows :

Programme 1	:	10
Programme 2	:	10
Viva	:	15
[Practical Copy + Internal Record]	:	15
Total		**50**

2. In every program there should be comment for each coded line or block of code.
3. Practical file should contain printed programs with name of author, date, path of program, unit number and printed output.
4. All the following programs or a similar type of programs should be prepared.

पाठ्यक्रम

पी.सी. सॉफ्टवेयर का परिचय व इन्टरनेट अनुप्रयोग

बी.सी.ए. भाग-I

पूर्णांक : 100

Unit I. **Using Office 2007 MS-Word :** Creating and editing word documents, formatting documents : aligning documents, indenting paragraphs, changing margin, formatting pages, formatting paragraph, printing labels, working with tables, formatting text in tables, inserting and deleting cells, rows and columns, use bulleted and numbering, checking spelling and grammar, finding synonyms, working with long documents, working with header and footer, adding page number and foot note, working with graphics, inserting clip art, working with pictures, Word art, creating flow chart, creating word templates, creating templates, working with mail merge, writing the form letter, merging form documents, selecting merge records, creating macros, running macro.

Unit II. **Working with MS-Excel :** Introducing Excel, use of excel sheet, saving, opening and printing workbook, Apply formats in cell and text, Divide worksheet into pages, setting page layout, adding Header and Footer, Using multiple documents, arranging windows i.e. (Cascade, Tiled, Split), protecting your work, password protection, Working with Functions and Formulas using absolute reference, referencing cell by name, using cell label, giving name to cell and ranges, working with formulas (mathematical and trigonometric, statistical, date time, most recently used), Working with Excel graphics, creating chart and graphs, filtering a database, using auto filter, criteria range, calculating total and subtotal, creating pivot table, goal seek, recording and playing macros, deleting and selecting macro location.

Unit III. **Working with MS-Powerpoint and MS-Access : Presenting with Powerpoint :** Creating presentation, working with slides, different types of slides, setting page layout, selecting background and applying design, adding graphics to slide, adding sound and movie, working with table, creating chart and graph, playing a slide show, slide transition, advancing slides, setting time, rehearsing timing, animating slide, animating objects, running the show from windows. **MS-Access :** Creating tables in Access, defining datatypes, creating relationships, Manipulating records.

Unit IV. **Introduction to HTML and Designing Web Page using MS-FrontPage :** Concept of website, web standards, what is HTML, HTML documents/files. HTML Editor, explanation of the structure of home page, elements in HTML document, HTML elements, HTML tags and basic HTML tags, viewing the source of webpage and downloading the WebPages source **Image, Internal and external linking between web pages :** IMG elements. **Features of Front page 2000**, Designing web page, working with views, Hyperlinks, setting Hyperlink, using list, themes, tables, Frames, style sheet, working with forms, page templates, frame templates, anchor, working with banners, Dynamic effect, How to publishing webpages in local area network.

Unit V. **Animations and Graphics :** Basic concept of 2D/3D Animation, Principle and application in Multimedia, Hardware and Software resources requirement for animation, steps for creating generic animation. Learn the basic of Flash Animation.

Creating a new movie : Get set up, input Text, animate Text, drawing and painting with tools, brush, create basic shapes like Oval, Rectangles and Polystar Tools, tools working with object and filling the object, Transformation, object properties dialog box, creating layers motion tweening, shape tweening, mask layers, basic action scripts, importing sound through Flash.

Interface of Photoshop : The Photoshop workspace use of menus palettes and toolbox, creating new images, using selecting tools, lasso tool, Direct select Lasso, convert point tool, image adjustment through Photoshop.

PRACTICAL WORK

1. **Scheme of Examination :**

Practical examination will be of 3 hours duration. The distribution of practical marks will be as follows :

Programme 1 (Word)	:	13
Programme 2 (Powerpoint/Access)	:	13
Programme 3 (Excel)	:	13
Programme 4 (HTML/Internet Tools)	:	16
Viva	:	25
[Practical Copy + Internal Record]	:	20
Total		**100**

2. In every program there should be comment for each coded line or block of code.
3. Practical file should contain printed programs with name of author, date, path of program, unit no. and printed output.
4. All the programs or a similar type of programs should be prepared.

पाठ्यक्रम

विविक्त गणित

(DISCRETE MATHEMATICS)

बी.सी.ए.भाग–I

पूर्णांक : 50

PAPER I

UNIT 1. Recall of statements and logical connectives, tautologies and contradictions, logical equivalence, algebra of propositions quantifiers, existential quantifiers and universal quantifiers.

UNIT 2. Boolean algebra and its properties, algebra of propositions as an example, De Morgan's Laws, Partial order relations g.l.b., l.u.b., Algebra of electric circuits and its applications. Design of simple automatic control system.

UNIT 3. Boolean functions : disjunctive and conjugative normal forms. Boolean's expansion theorem, fundamental forms. Many terminal Networks.

UNIT 4. Arbitrary Cartesian product of sets. Equivalence relations, partition of sets, injective, surjective, bijective maps, binary operations, countable, uncountable sets.

UNIT 5. Basic Concept of Graph Theory, Sub graphs, Trees and their properties, Binary Trees, Spanning Trees, Directed Trees, Planar graphs, Euler Circuit, Hamiltonian graph, Chromatic number.

BCA PART - II

Subject Code	Subject Paper	Theory Marks		Internal Marks		Teaching Load per Week		
						L	T	P
		Max. (A)	Min. (B)	Max. (C)	Min. (D)			
*** BCA201**	Part-I : Numerical Analysis	50	60	-	-	2	-	-
	Part-II : Differentiation and Integration	50		-	-	2	-	-
	Part-III : Data Structures	50		-	-	2	-	-
BCA202	DBMS (Oracle, SQL)	100	40	50	30	4	2	-
BCA203	Programming in C++ & Visual C++	100	40	50	30	4	2	-
BCA204	Computer Networking & Internet Technology	100	40	50	30	4	2	-
BCA205	A. Shell Programming in Unix/Linux	50	20	-	-	2	2	
	B. Practical based on course 205A	50	20	-	-	-	-	1x2
BCA206	A. Principles of Management	50	40	-	-	2	-	-
	B. Foundation Course	50		-	-	2	-	-
BCA207	Practical Based on Course-202 & Mini Project (Visual Basic & Oracle/Access)	100	50		-	-	-	3x2
BCA208	Practical Based on Course-203	100	50		-	-	-	2x2
TOTAL		850	360	150	90			
GRAND TOTAL	(PAPER + INTERNAL)	**(A+C) 1000**		**(B+D)** 450				

* Minimum passing marks in subject BCA201 is 40% of total marks 150(i.e. Total of Part I + Part II + Part III marks of BCA201)

BCA - 201
THEORETICAL FOUNDATION OF COMPUTER SCIENCE
PAPER - I : Numerical Analysis

Max Marks : 50

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Simple / Scientific calculator is allowed.

UNIT – I SOLUTION OF POLYNOMIAL AND TRANSCENDENTAL ALGEBRIAC EQUATIONS

Bisection method, Regula falsi method & Newton's method, Solution of Cubic & Biquadratic Equation.

UNIT – II SIMULTANEOUS EQUATIONS AND MATRIX

Gauss-Jordan method, Cholesky's method , Reduction to lower or upper Triangular forms , Inversion of matrix , method of partitioning , Characteristics equation of matrix , Power methods , Eigen values of matrix , Transformation to diagonal forms.

UNIT – III INTERPOLATION - SINGLE VARIABLE FUNCTIONS

Newton's Interpolation formula, Newton's Forward and Backward Difference Interpolation Formula, Langranges Interpolation formula, Newton's Divided Difference Interpolation Formula.

UNIT – IV NUMERICAL DIFFERENTIATION AND INTEGRATION

Newton - cotes integration formula, Trapezoidal Rule, Simpson's One-Third and Three-Eight Rule, Waddle's Rule.

UNIT – V NUMERICALS SOLUTION OF ORDINARY DIFFERENCTIAL AND INTEGRAL EQUATION

Numerical Solution of first order Ordinary Differential Equations, one step method, Euler's, Picard's and Taylor's series Methods, Picard's Methods for successive approximations, Runga-Kutta Method.

BOOKS RECOMMENDED

1. *Garewal* : Numerical methods
2. *Gupta & Mallic* : Numerical Methods
3. *Hamming R.W.* : Numerical methods for scientist & Engineers. (McGraw Hill)
4. *Conle S.D.* : Elementary numerical analysis
   Carl De Boor (International Book Company London)
5. *Jain M.K.* : Numerical methods for Science and Engineering
   Iyengar S.R.K calculations (John Willey & Sons)

BCA - 201
THEORETICAL FOUNDATION OF COMPUTER SCIENCE
PAPER - II : Differentiation and Integration

Max Marks : 50

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.

Differentiation

UNIT - I

Successive Differentiation, Lebnitz's Theorem, Rolle's Theorem, Lagrange's and Cauchy Mean Value Theorem, Taylor's Theorem, Expansion by Taylor's and Maclaurin's series.

UNIT – II

Asymptotes, Curvature, Test of Convexity and Concavity, Point of Inflaxion,Tracing of Curves in Cartesian and Polar form.

UNIT - III
Partial and Directional Derivatives of functions of two and three variables, Jacobian's Theorem.

Integration

UNIT - IV
Integration of functions by parts, by substitution and by partial fraction; Definite Integral and its properties.

UNIT - V
Integration of functions of two and three variables, Change of order of Integration, Determination of Area and Length.

BOOKS RECOMMENDED
1. Differential Calculus - Gorakh Prasad
2. Differentiation and Integration - H.K. Pathak

BCA - 201
THEORETICAL FOUNDATION OF COMPUTER SCIENCE
PAPER - III : Data Structures

Max Marks : 50
NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.

UNIT – I INTRODUCTION -
Introduction, Basic terminology, Elementary data organization, Data structure, Data structure operation,

UNIT – II CONCEPTS OF ARRAYS, RECORDS AND POINTERS –
Basic Terminology, Linear Array; Sorting : Bubble Sort; Searching: Liner Search, Binary Search, Pointers : Pointer Array; Records: Record Structures.

UNIT – III LINKED LISTS, STACKS, QUEUES, RECURSION –
Link lists, Traversing a linked list, searching a linked list; Insertion into a linked List, Deletion from a Linked List, Stacks, Array Representation of Stack; Queues.

UNIT – IV TREES -
Types of Trees, Binary Trees, Representing Binary, Traversing binary tree, Searching and Inserting in Binary Tree, Deleting in Binary tree.

UNIT - V
SORTING AND SEARCHING –
Sorting, Insertion Sort, Selection Sort, Merging, Merge.

BOOKS RECOMMENDED :

1. Data Structure **- Seymour Lipschutz (Schaum's Series).**
2. Data Structure & Program Design **- Robert L. Kruse, 3rd Ed., Prentice Hall.**

BCA -202
DBMS (Oracle, SQL)

Max Marks : 100 Min. Marks : 40

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.

UNIT – I OVERVIEW OF DATABASE MANAGEMENT SYSTEM :
Database, Definition of DBMS, Purpose of Database System, Data abstraction, Instances and Schema, Data Independence, Data administration roles, Different kinds of DBMS users, Data Dictionary, Data base languages- DDL, DML, DCL Data Models- The Relational approach, The Network approach, The Hierarchical approach, DBMS storage structure and access method.

UNIT – II ENTITY-RELATIONSHIP MODEL:
Entity - Relationship model as a tool for conceptual design-entities attributes and relationships. ER diagrams; Concept of keys: candidate key, primary key, alternate key, foreign key; Strong and weak entities, Case studies of ER modeling Generalization; specialization and aggregation. Converting an ER model into relational Schema.

UNIT – III Structured Query Language
Relational Algebra : select, project, cross product different types of joins (inner join, outer joins, self join); set operations, Simple and complex queries using relational algebra. Integrity constraints: Not null, unique, check, primary key, foreign key.

UNIT – IV Relational Database Design-
Normalization concept in logical model; Pitfalls in database design, update anomalies: Functional dependencies, Join dependencies, Normal forms (1NF, 2NF, 3NF). Boyce Codd Normal form, Decomposition, Multi-Valued Dependencies, 4NF, 5NF.

UNIT – V INTRODUCTION TO ORACLE :
Introduction to Commercial database query language, SQL & its environment. SQL as a data definition language- creating tables, altering tables, drop tables. SQL as data manipulation language- Inserting, Deleting ,Retrieving and updating data in a table. SQL as query language. Introduction to SQL constructs (SELECT…FROM, WHERE… GROUP BY… HAVING… ORDERBY….), Temporary tables, Nested queries

Suggested Books :

1. Data base system : Korth & Silberschatz.
2. Data Base Management System : Alexies & Mathews [Vikas publication
3. An Introduction to Data base System : C.J. Date
4.. Data Base Management System : Raguramakrishnan.

BCA - 203
Programming in C++ & Visual C++

Max Marks : 100 Min. Marks : 40

Note : The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.

UNIT - I

Overview of Object Oriented Concepts
Need for Object Oriented programming; Procedural Languages; The Object Oriented approach; advantages of Object Oriented Programming; characterization of Object Oriented Languages; Objects; Classes; inheritance; reusability; New data types; Polymorphism and overloading.

UNIT - II

Object Classes and Inheritance

Object and Class, Using the class, class construct, class destructors, object as function argument, struct and classes, array as class member, operator overloading. Type of inheritance, Derive class, Base class. Access specifier: protected. Overriding, member function, String,

UNIT - III

Object Oriented Programming

In overview of C++ Programming; Loops and decisions; Structures and functions. Arrays and Pointers, Inheritance, Overloaded Function, Inline Function, Virtual Functions, pure virtual Functions Streams.

UNIT - IV

Object Oriented Design & Database

Object structure concepts; Object type; Attribute types; relationship type; Object behavioral concepts; Methodology for Object Oriented Design; Booch methodology Relational Vs Object Oriented Databases, The architecture of Object Oriented Databases.

UNIT - V

Introduction to VC++ - C under windows, Overview of VC++, VC++ workspace & projects, creating source code file, adding C++ code to a program.

Introduction to MFC - The part of VC++ programs, the application object, the main window object, the view object, the document object, Windows event oriented programming, what is device context.

RECOMMENDED BOOKS :

1. Object Oriented Programming : McGregor and Sykes S A, 1992 Van Nostrand.
2. The C++ Programming Language : Strustrp B,Addision Wasley.
3. Object Oriented Programming in C++ : Lafore R, Galgotia Publications.
4. Introduction to Object Oriented Programming : Witt KV, Galgotia Publications.
5. Object Oriented Programming : Blaschek G, Springer Verlag
6. Object Data Management : Cattel R, Addison Wasley.
7. Modern Database Systems : Kim W, ACM Press, Addision Wesley.

VC++

1. Visual C++ in Record time : Steven Holzner
2. Visual C++ Programming : Yashwant P. Kanetkar

BCA - 204
Computer Networking & Internet Technology

Max Marks : 100 Min. Marks : 40

Note : The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.

UNIT - I

Introduction to Computer Networking-

Data Communication, Networks - Distributed Processing, Network Criteria, Applications; Protocols and Standards, Standard Organization, Line Configuration - Point to Point, Multi Point; Topology - Mesh, Star, Tree, Bus, Ring, Hibrid; Tansmission mode, Categories of Network - LAN, MAN, WAN, Inter Networks.

UNIT - II

The OSI Model -

The model - Layered architecture, functions of the layers-Physical layer, Data Link layer, Network layer, Transport layer, session layer, Presentation layer, Application layer; the TCP/IP reference model, comparison of TCP/IP & OSI, Novell Netware, Arpanet, NSFNET.

UNIT - III

Transmission of Digital Data -

Analog and Digital, digital data transmission - parallel transmission, serial transmission, DTE-DCE interface - data terminal equipment, data circuit terminating equipment, standards, modems- Transmission rate, Modem standards.

UNIT - IV

Introduction to Internet Technology - Architecture of Internet, Client server model, www, The concept of web publishing, The HTML Basics Review, Tables, frames, image maps, forms & Introduction to CGI Scripting.

UNIT - V

Scripting Language for Web Design :- What is java , Introduction to java applet, Adding applet to web page, JavaScript ,Structure of Java Script, Basic Commands of Java Script, dynamic html.

Cascading Style Sheets & Web Server – Defining styles within HTML tags. Features of Style sheet, Web server, Publishing website, Case Studies.

Recommended Books-

1. Introduction to Data communication & Networking - Behrouz & Forouzan
2. Computer Networking - Andres & Tanenbaum
3. Web publishing - Monica D'Souza & Jude D'Souza.
4. www Designing with HTML - C Xavier

BCA - 205
LINUX

Max Marks : 50 Min. Marks : 20

Note : The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not scientific calculator.

UNIT - I

Introduction to Linux

Introduction to Linux system, History and Emergence, Features of Linux system, Different Linux distributions, Hardware Requirements for the different versions of Linux, Architecture of the Linux, Features of the Kernel and Kernel Shell relationship.

Linux File System

Features of Linux file system, File types and permissions, Getting started, Logging in /out with the concept of home directory. File operations and links, Commonly used commands like GREP, Find, who, ls, pwd, mv, ls, cd, df, cat, head, tail, rm, sort, grip, ps, whoami, chmod, chonn,gunzip,date, bc, tar.

UNIT - II

Text Processing

Introduction to Text Processing, Vi editor, Vi Features, Vi Commands, Yanking, Running shell commands, from within Vi, Command macros, Set showmode, Set Auto Indent, Set number, Introduction to Exrc file.Emacs editor, Emacs feature, Emacs commands, Using cut, paste and copy in Emacs, Saving buffer in Emacs.

UNIT - III

Shell Programming

Introduction to Shell & Shell Programming: Features of a Shell, Different types of a Shell, Why use more shell, Shell treatment to the command line, the environment, set, setenv, path, home, ifs, mail, ps1, ps2, term, log name, profile, sty, profile file, login/logout file, setting environment, simple shell programs, for… do, case, do while construct.

UNIT - IV

X-windows

x-windows: what is X-windows, Microsoft windows verses x-windows, windows manager, FVWM and FVWM95, twn, the client server model of x-windows, starting and stopping an X-window session.

GNOME & KDE

Using the GNOME & KDE desktop environment : starting the GNOME desktop environment, the GNOME panel, using the main system menu, the Gnome file manager, getting help in GNOME, using the Gnome control. A history of KDE project, starting the KDE desktop environment, exploring the Kde desktop, KDE main system menu, using file manager window, setting wallpaper, screen savers in KDE

UNIT - V

System Administration of Linux

Installation & system Administration of Linux: responsibilities of a system administrator, startup and shutdown process, inittub and profile file importance, security file access permission, user and group related jobs, managing disk space, managing file system, backup and restart process. PRC- installation requisite, minimum hardware requirement for Red Hat Linux, Hard Disk Partitioning, installation of Red Hat Linux Installation of Printer, Scanner and Peripheral devices in Linux.

REFERENCES:

Mastering Linux : BPB publication
Complete Reference Linux.

BCA - 206
Principles of Management

Max Marks : 50

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT - I

MANAGEMENT:

Concept, Nature and Scope of management. The evolution of Management thought, Approaches of management, New classical school, Modern organizational Theories, Behavourial Approach and Systems Approach, Tasks of a professional Manager, Responsibilities of a Professional Manager, Management Systems and Processes, Managerial Skills.

UNIT - II

PLANNING:

Significance, Objectives Types of Plans, Strategies & Polices, Proceedings methods & rules Project Management, Planning Evaluation, Feasibility Report, Planning Process Planning under systems approach.

UNIT-III

ORGANIZING

Significance, objectives, Major approaches to organizational theory, Organizational Structure and Design, the organizational Process, span of control or Departmentation, Delegation of Authority & Inter Department Coordination, Decentralization, Determinants of effective organizing, staffing, selection, appraisal and development of Managers.

UNIT-IV

DIRECTING

Significance and issue in managing human factors. Motivation, nature and significance theories and techniques, Leadership styles and influence process, Leadership challenges.

Managerial Communication, definition & Significance, Types of communication, the process and barriers, Building effective communication system, Supervision nature and function, determination of effective supervision.

UNIT-V

CONTROLLING & DECISION MAKING

Definition and elements, Control Techniques, Coordination and determinants of an effective control system.

Organizational, Context of Decisions, Decision Making Models, Decision Making Techniques and Processes.

Recommended Books:

1. Principles of Management by Terry Franklin
2. Essentials of Management by Koontz H. O Donnell ;Tata McGraw Hill, New Delhi
3. Management by Stoner J.A.F ; prentice Hall, New Delhi

BCA - 206

B. Foundation Course: As prescribed by University for B.Sc. Courses

CALCULUS & GEOMETRY

MAX. MARKS: 50

NOTE :- THE QUESTON PAPER SETTER IS ADVISED TO PREPARE UNIT-WISE QUESTON WITH THE PROVISION OF INTERNAL CHOICE. ONLY SIMPLE CALCULATOR IS ALLOWED NOT SCIENTIFIC CALCULATOR.

CALCULUS

UNIT:-1 The Riemann Integral, Existence of the Riemann Integral, properties of Riemann integrals, Fundamental Theorem of Integral a Calculus.

UNIT:-2 Maxima and minima of functions of two and three variables. Langrange's method of undetermined multipliers.

UNIT:-3 Improper integrals, Meaning of integrals of type $\int_a^\infty f(x)dx$, $\int_a^b f(x)dx$ Where f(x) is not defined at a and/or b. Tests of convergence for improper integrals.

GEOMETRY

UNIT:-4 Equation to cone with given base, Generators of Cone, condition for three mutually perpendicular generators, Right Circular Cone, Equation of a cylinder.

UNIT:-5 Polar Coordinates, Polar equation to straight Line, Circle. Polar equation of a Conic.

REFERENCE:

1. CALCULUS OF TWO AND VARIABLES : G.S. PANDAY & V.P. SAXENA (WILEY EASTERN)
2. HIGHER CALCULUS :

COMPUTER SYSTEM ARCHITECTURE

MAX. MARKS: 50

NOTE :- THE QUESTON PAPER SETTER IS ADVISED TO PREPARE UNIT-WISE QUESTON WITH THE PROVISION OF INTERNAL CHOICE. ONLY SIMPLE CALCULATOR IS ALLOWED NOT SCIENTIFIC CALCULATOR.

UNIT:-1 Data Representation- Data Types, Number System, Fixed Point Representation-1's, 2's complements, Binary Fixed point representation, Arithmetic operation on Binary operation, Overflow & Underflow, Codes, ASCII, EBCDIC codes, Grey codes, Excess-3, BDC codes, ERROR detection & correction code.

UNIT:-2 Digital Logic Circuits- Logic Gates AND,OR,NOT,Gates & their truth tables, NOR, NAND & XOR Gates, Boolean algebra, Basic Boolean Law, Doorman's theorem, Map simplification, Minimizing technique, K Map, Sum of product of sums, Combinational & sequential Circuits Half adder & Full adder, Full Subtractor, Flip Flop – RS, D, JK & T Flip Flop, Shift register, RAM & ROM.

UNIT:-3 CPU organization, ALU & Control circuit, Idea about arithmetic circuits, Program control, Instruction sequencing, Introduction to Microprocessor, Microprocessor architecture, System buses, Registers Program counter, Block diagram of a Macro computer system, Microprocessor control signals, Interfacing Devices, Introduction to Motherboard, SMPS

UNIT:-4 Input output organization, I/O interface, Properties of simple I/O devices and their Controller, Isolated versus Memory, mapped I/O, Modes of Data transfer, Synchronous & Asynchronous Data Transfer, Handshaking, Asynchronous serial transfer, I/O processor.

UNIT:-5 Auxiliary memory – Magnetic drum, Disk & Tape, Semi conductor memories, Memory Hierarchy, Associative memory, Virtual memory, address space & memory space, Address mapping, Page table, Page replacement, cache memory, Hit ratio, Mapping Techniques, Writing into cache.

REFERENCE

1. COMPUTER SYSTEM ARCHITECTURE – M. MORIS MANO

DIFFERENTIAL EQUATIONS
&
FOURIER SERIES

MAX. MARKS: 50

NOTE :- **THE QUESTON PAPER SETTER IS ADVISED TO PREPARE UNIT-WISE QUESTON WITH THE PROVISION OF INTERNAL CHOICE. ONLY SIMPLE CALCULATOR IS ALLOWED NOT SCIENTIFIC CALCULATOR.**

UNIT:-1 Concept of Differential equation. Recall of first order and first degree differential equations, Equation of first order but of higher degree. Homogeneous and exact differential equations.

UNIT:-2 Geometric representation, Family of curves and orthogonal trajectories. Linear differential equation with constant coefficients. Operational rules of D. Homogeneous linear equations.

UNIT:-3 Partial differential equation of first order, Standard forms, Linear partial differential equations of higher order with constant coefficients.

UNIT:-4 Periodic Function, Fourier Sine and Cosine Series, Even and Odd Functions Full Range and Half Range Fourier Series

UNIT:-5 Convergence of Fourier Series, Gibbs Phenomenon, Operations on Fourier Series, Application of Fourier Series to Differential Equation.

REFFERENCE:;

1. INTRODUCTORY COURSE IN DIFFERENTIAL EQUATIONS : D.A. MURRAY
2. DIFFERENTIAL EQUATIONS (AWKL SAMEEKARAN) : B.P.PARASHAR & L.P. RAJPAL
3. DIFFERENTAL EQUATIONS AND FOURIER SERIES : H.K. PATHAK

COMPUTER OPERATING SYSTEMS

MAX MARKS : 100

NOTE :- THE QUESTON PAPER SETTER IS ADVISED TO PREPARE UNIT-WISE QUESTON WITH THE PROVISION OF INTERNAL CHOICE. ONLY SIMPLE CALCULATOR IS ALLOWED NOT SCIENTIFIC CALCULATOR.

UNIT:-1 **INTRODUCTION**

What is operating system, basic concepts, terminology, batch processing, spooling multiprogramming, time sharing, real time systems, protection, multiprocessor system, operating system as resource manager, process view point, memory management, process management, device management and information management, other views of operating system, historical, functional job control language and supervisor service control.

UNIT:-2 **PROCESSOR MANAGEMENT (CPU SCHEDULING)**

Reviewing of multiprogramming concept, scheduling concept, basic concept CPU I/O burst cycle processor state, PCB (programme Control Block) scheduling queries schedulers, scheduling algorithms – performance criteria, first-come - first served shortest job first priority, pre-emptive algorithm, round robin, multilevel queues and multilevel feedback queues, algorithm evolution, multiprocessor scheduling separate system, coordinated job scheduling, master / slave scheduling.

UNIT:-3 **MEMORY MANAGEMENT**

Preliminaries of memory management, memory handling in M/C, relocation, swapping and swap time calculation, multiple partition, partitioned allocation MFT, fragmentation, MVT, compaction, paging, job scheduling implementation of page tables, shared page, virtual memory-overlays, concepts of virtual memory demand page, memory management and performance, page replacement and page scheduling – physical characteristics fcfs scheduling SCAN, short of seek time first disk scheduling algorithms sector queuing.

UNIT:-4 **INFORMATION MANGEMENT (FILE SYSTEM)**

File concept, file type, typed based system, disk based system, general model of file system, file directory maintenance, symbolic file system, basic file system, physical file system, file support devices directory, access methods free space management contiguous, linked allocation and indexed allocation performances.

PROGRAMMING IN JAVA

MAX MARKS : 100

NOTE :- THE QUESTON PAPER SETTER IS ADVISED TO PREPARE UNIT-WISE QUESTON WITH THE PROVISION OF INTERNAL CHOICE. ONLY SIMPLE CALCULATOR IS ALLOWED NOT SCIENTIFIC CALCULATOR.

UNIT:-1 **INTRODUCTION :**
Genesis of java, importance to the Internet, overview of features.
OOP :
OOP features, data types; control structures, arrays, methods and classes, nested & inner classes, string and String Buffer class, Wrapper Class, vectors.

UNIT:-2 **INHERITANCE :**
Basics type.. method Override, using abstract and final classes, using super.
PACKAGES AND INTERFACES:
Defined CLASSPATH, importing packages, implementing interface.

UNIT:-3 **EXCEPTION HANDLING :**
FUNDAMENTAL :
Exception types, using try and catch, throwing exceptions, defined exceptions.
MULITHREADED PROGRAMMING:
Java spread model, creating threads, and thread priorities, synchronization Suspending resuming and stopping threads.

UNIT:-4 **INPUT/OUTPUT:**
Basics Streams, Byte and Character Stream, predefined streams, reading and writing from console and files. Using standard Java Packages (Lang,util,io).
NETWORKING : Nasecs. TCP/IP client & server sockets, URL connection.
JDBC : Setting the JDBC connectivity with backend database.

UNIT:-5 **APPLETS:**
Fundamentals, life cycle, overriding update, HTML APPLATE tag, passing parameters Developing single applets.
INTRODUCTION TO AWT :
Window fundamentals, creating windowed, programs waking with graphics, using AWT controls, menus. Delegation event model, handling mouse and keyboard events.

BOOKS RECOMMENDED:

1. JAVA PROGRAMMING: KHALID MUGHAL
2. JAVA PRIMER : BY E.BALAGURUSWAMI

UNIT:-5 **DEAD LOCKS**

The Dead Lock problem – Dead Lock definition, Dead Lock detection, detection algorithm usage, Dead lock characterization, resource allocation graph, Dead lock prevention, mutual exclusion, hold and wait, no pre-emption and circular wait, dead resource pre-emption, combined approach to Dead Lock handling.

BOOK RECOMMENDED :

1. PRINCIPAL OF OPERATING SYSTEM – PETERSION
2. OPERATING SYSTEM

SOFTWARE ENGINEERING

MAX MARKS : 100

NOTE :- **THE QUESTON PAPER SETTER IS ADVISED TO PREPARE UNIT-WISE QUESTON WITH THE PROVISION OF INTERNAL CHOICE. ONLY SIMPLE CALCULATOR IS ALLOWED NOT SCIENTIFIC CALCULATOR.**

UNIT:-1 **INTRODUCTION TO SOFTWARE ENGINEERING**

e. Definition
f. Need and software problem
g. Software Crises
h. Software Engineering Problem
   1. Fundamental Problem
   2. Important Quality of Software Product
i. Software Engineering Approach
   1. Phase Development Process
   2. Life Cycle of Software
j. Principles Of Software Engineering
k. Software Development Process Model
   1. Waterfall Model
   2. Spiral Model
   3. Prototype Model
   4. Iterative Model

UNIT:-2 **PROJECT MANAGEMENT**

a. The Phase Management Process
b. Software Metrics
   1. Size Oriented Metrics
   2. Function Oriented Metrics

UNIT:-3 **SOFTWARE REQUIREMENT AND SPECIFICATION**

a. Introduction and Need of SRS
b. Structure Analysis
   1. Data Flow Diagram
   2. Context Diagram
   3. Data Dictionary

UNIT:-4 **SOFTWARE DESIGN & CODING**

f. Principal of software Design
   1. Partitioning
   2. Abstraction
   3. Top Down and Bottom up Strategies

Concept of Module
   1. Coupling
   2. Cohesion

h. Structured Chart
i. Coding-
   a. Rules of Good Programming Style
   b. Code Verification

UNIT:-5 **SODTWARE TESTING AND MAINTENANCE**

a. Definition
b. Testing Fundamentals
   Error, Fault, Failure
c. Test Oracles
d. Types of Testing
   1. Black Box Testing
   2. White Box Testing
e. Level of testing- Unit, Integration, System, Acceptance
f. Introduction of Maintenance

BOOK RECOMMENDED

1. SOFTWARE ENGINEERING : BY ROGER PRESSMAN

MULTIMEDIA TOOLS AND APPLICATION

MAX MARKS : 100

NOTE :- THE QUESTON PAPER SETTER IS ADVISED TO PREPARE UNIT-WISE QUESTON WITH THE PROVISION OF INTERNAL CHOICE. ONLY SIMPLE CALCULATOR IS ALLOWED NOT SCIENTIFIC CALCULATOR.

UNIT:-1 **MULTIMEDIA:** Needs and areas of use, Development platforms for multimedia – DOS window, Linux. Identifying Multimedia elements – Text, Images, Sound, Animation and Video, Making simple multimedia with Powerpoint.

TEXT – Concepts of plain & formatted text, RTF & HTML texts, using common text preparation tools, Conversion to and from of various text formats, using standard software, Object Linking and Embedding concept, Basics of font design, overview of some fonts editing and designing tools, Understanding & using various text effects.

IMAGES – Importance of graphics in multimedia, vector and Raster graphics, images capturing methods – scanner, digital camera etc. Various attributes of Images – size color, depth etc. Various Image file format – BMP, DIB, EPS, CIF, PEX, PIC, JPG, TGE, PNG and TIF format – their features and limitations, graphic file formats conversions, processing images with common software tools such as Photoshop. Paint Shop pro. Corel draw etc..

UNIT:-2 **SOUND:** Sound and it Attributes, Mono V/S Stereo sound, Sound channels, Sound and its effect in multimedia, Analog V/S Digital sound, Basics of digital sounds Sampling, Frequency, Sound Depth, Channels Sound on PC, Sound standards, on editing software. Overview of various sound file formats on PC – WAV , Mp3, Mp4, Ogg Vorbose etc.

ANIMATION : Basics of animation, Principal and use of animation in multimedia, Effect of resolutions, pixel depth, Image size on quality and storage. Overview of 2-D and 3-D animation techniques and software – animation pro, 3D studio & Paint Shop pro animator.

Animation on the Web – features and limitations, creating simple animations for the Web using GIF Animator and Flash.

UNIT:-3 **VIDEO :** Basics of Video – Analog and Digital Video, How to use video on PC, Introduction to graphics accelerator cards, DirectX Introduction to AV/DV and IEEE1394 cards, Digitization of analog video to digital video, Interlacing and non – interlacing, Brief note on various video standards – NTSC, PAL, SECAM, HDTV, Introduction to video capturing Media & instrument – Videodisk, DVCAM, Camcorder, Introduction to digital video compression techniques

and various file formats – AVI, Brief Introduction to video editing and movie making tools – Quick time, video for windows & Adobe premier.

UNIT:-4 **AUTHORING TOOLS FOR CD BASED MULTIMEDIA :**

Type of multimedia authoring tools, key factors of selecting CD based multimedia authoring tools, Planning and distribution of a multimedia project. Multimedia development team & skills requirement, Stages in designing & producing multimedia products for CD, Testing of product, distribution of multimedia product, various formats of CD's and DVD's.

UNIT:-5 **MULTIMEDIA ON THE WEB :**

Bandwidth relationship, broadband technologies, Text in the web – Dynamic and embedded font technology, Audio on the Web – Real Audio and MP3/MP4, Audio support in HTML, Graphics – HTML safe color palate, Interlaced V/S Non interlaced model, Graphics support in HTML, Image Map, Video on the Web – Streaming video, Real Video, MPEG and SMIL, Virtual Reality on the Web.

TEXT AND REFERENCE BOOKS :

1. MULTIMEDIA : MAKING IT WORK (4th EDITION) – BY TAY VAUGHAN, TATA MCGRAW HILLS.
2. MULTIMEDIA IN ACTION – JAMES E SHUMAN – VIKASH PUBLISHING HOUSE,

FINANCIAL MANAGEMENT & ACCOUNTANCY

MAX MARKS : 100

NOTE :- **THE QUESTON PAPER SETTER IS ADVISED TO PREPARE UNIT-WISE QUESTON WITH THE PROVISION OF INTERNAL CHOICE. ONLY SIMPLE CALCULATOR IS ALLOWED NOT SCIENTIFIC CALCULATOR.**

1. FINANCIAL ACCOUNTING :
   Meaning and Nature, Accounting Principles underlying the preparation of financial statements.
2. PREPARATION OF FINANCIAL STATEMENT :
   A Synoptic view – Profit and Loss account, Balance Sheet
3. FINANCIAL STATMENT ANALYSIS
   Ratio analysis (Liquidity, Solvency, Profitability, Efficiency), Statement of Changes in financial position – working capital basis.
4. Conceptual Framework of Cost Accounting
   Meaning nature and need of cost accounting, Elements of cost, Preparation of cost – sheet, Cost concept – Opportunity and imputed costs.

5. Cost – volume Profit (CPV) relationship
   Break – even analysis; (single and multiple products), Determination of sales volume to attain desired profits, Case break – even point. Graphic presentation of CVP relationship Assumptions and limitation of break – even analysis.
6. Budgeting :
   Definition and objective. Preparation of various type of budgets including cash budget Fixed and flexible budgets.
7. Cost Accumulation System
   Job and Process (simple treatment)
8. Variable and absorption costing systems
   Comparison for income determination (simple treatment), Variable costing as a tool of decision – making.